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LATHAM & WATKINS LLP

July 6, 2017

VIA ELECTRONIC SUBMISSION

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: WC Docket Nos. 10-90, 14-58, 07-135, 05-337, and 03-109; GN Docket No. 09-51; CC Docket Nos. 01-92 and 96-45; WT Docket No. 10-208

Dear Ms. Dortch:

ViaSat, Inc. hereby submits the enclosed white paper prepared by Dr. Paul Milgrom of Auctionomics. The white paper responds to an analysis prepared by Dr. David J. Salant on behalf of the Rural Coalition, which was filed in this proceeding on June 14, 2017.[1] Dr. Salant's analysis, and the accompanying cover letter prepared by the Rural Coalition, purport to address earlier inputs submitted by ViaSat and Dr. Milgrom in this proceeding.[2]

Although Dr. Milgrom's white paper speaks for itself, ViaSat takes this opportunity to separately address the Rural Coalition's suggestion that ViaSat's earlier inputs constitute an untimely petition for reconsideration. To the contrary, those inputs were provided to inform the Commission's efforts to further define the structures and procedures to be used in upcoming CAF II reverse-auction—including through the development of an auction procedures public notice.[3] The Commission is free to consider ViaSat's inputs for those purposes, or any others the Commission deems suitable.

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1 *See* Letter from Rural Coalition to FCC, WC Docket No. 10-90 (June 14, 2017).

2 *See* Letter from ViaSat, Inc. to FCC, WC Docket No. 10-90 (May 2, 2017).

3 *See Connect America Fund*, 32 FCC Rcd 1624, at ¶ 9 (2017) ("Next, we intend to release a Commission-level public notice that will seek comment on specific details regarding the mechanics of the Phase II auction . . .").

Please contact the undersigned should you have any questions in this matter.

Respectfully submitted,

/s/ John P. Janka
John P. Janka
Jarrett S. Taubman

Counsel for ViaSat, Inc.

[Auction]omics

Paul Milgrom's Response to the Rural Coalition Filing

July 6, 2017

A Fallacious Response

The Rural Coalition has filed a response that recommends rejecting the ViaSat efficiency auction design, and attaches a paper by Dr. David Salant for support. Using numerical examples and a so-called 'proof,' Dr. Salant attempts to demonstrate that ViaSat's efficiency design would disadvantage Gigabit service and produce unfavorable outcomes for his clients.

Dr. Salant's analysis is incomplete, and its conclusions rely on incorrect statements and misleading examples. Although the FCC has not yet adopted an auction mechanism, to make a comparison, Dr. Salant offers an interpretation of a design that the FCC *might* implement if it gives no consideration to coverage. This "Salant design" is based on questionable logic and maximizes no coherent objective (though it does confuse the reader about ViaSat's proposed design). For example, even if the Commission's budget were sufficient to fund Gigabit service to all remaining CAF II households, the Salant design could still select cheaper low-tier[1] bids, while the efficiency design could never do that.

To buttress the theoretical analysis, the Salant white paper includes a few limited examples in which the budget is highly restricted, but these demonstrations are incomplete and misleading. These examples conceal the role that a binding budget constraint would realistically play in bid selection. They shed no light and offer no discussion of how to make the best use of the limited funds for this broadband service procurement. ViaSat's proposed efficiency design trades service tier for coverage *according to the FCC's adopted scoring*. At the 'margin' at which some combination of high- and/or low-tier bids might be accepted when the auction budget is binding, the efficiency design weighs the potential tradeoffs involving either coverage and service tier, or service tier in one area versus service tier in a different area, taking account of whether a low-cost alternative may be available in each area. The Salant white paper omits this accounting, and instead includes an example in which greater unspent budget under the Salant design is hailed as a cost advantage, rather than as a missed opportunity to provide higher-tier service to some areas or to serve a wider set of areas.

The Salant Filing is Incorrect and Misleading

Dr. Salant's white paper is incorrect in several respects. First, it ignores the bad performance of the Salant design when the budget proves sufficient relative to the set of areas for which there are bids for service. Because the Salant design always selects bids in order of ascending 'FCC score,' it could select an

[1] We use the terms 'low-tier' and 'high-tier' in reference to the service categories for performance (from Minimum to Gigabit) and latency (High or Low) adopted in the FCC's *Report and Order and Order on Reconsideration*.

inexpensive low-tier bid over a Gigabit Low latency bid, even when sufficient funds would permit purchasing higher-tier service.

Pages 9-12 of the Salant filing construct an example (3.1) intended to demonstrate differences between the two designs. The example concludes with three 'costs' of ViaSat's proposed efficiency design as compared to the Salant design.

> [1] The service in Area A is significantly downgraded from Gigabit Low latency to Baseline High latency.

Dr. Salant grants that "the ViaSat approach does slightly improve bandwidth in Area B from Minimum to Baseline [10/1 to 25/3 Mbps]." However, he fails to note that Area B, according to the reserve prices, has five times the weight of Area A. This is no accident – the ViaSat efficiency design trades service tier for coverage *only* when a region that is sufficiently highly cost-weighted would have its service tier increased. A region with lower expected costs receives lower-tier service, but a region that is much more highly weighted by the Commission's reserve price criterion gains higher-tier service.

> [2] The total cost [*of the bids that are selected* under the efficiency design] is increased by 50% [relative to the Salant design], from $40 to $60.

This is an artifact of the particular example offered, and reveals no disadvantage of ViaSat's proposed efficiency design. The cost is greater using the efficiency design in this example because the Salant design fails to make best use of the available funds, leaving a significant portion of the budget unused.

> [3] The average bid score ($S = 100 \times \frac{B}{R} + T + L$), even when weighting by the reserve price, increases from 108.3 to 120.

The flip side of this is that the objective, Total Efficiency, increases from 3000 to 3600. This third point is not new evidence, but rather a restatement of the distinction between the two designs. ViaSat's efficiency design seeks to maximize Total Efficiency, as determined from the FCC's speed and latency scores and reserve prices, and not to maximize the average bid score of a small number of areas.

On page 13 of the filing, a further example (3.2) is presented. Because of the reserves, bids and budget chosen, it appears to demonstrate that the ViaSat design unduly prioritizes high-cost regions. Dr. Salant's own formulations, however, show this conclusion to be erroneous: on page 14, he offers a simplified variation of the ViaSat efficiency design, which selects bids in order of their bid divided by the bid's `ViaSat score,' which Dr. Salant denotes by S_{Qj}. In example 3.2, the 'ViaSat scores' S_{Qj} (when calculated, as Dr. Salant does not provide them in his table) are exactly proportional to the 'FCC scores' S_j. Indeed, both designs, in their 'prioritizations,' prefer the bids in reverse order, from E to A. This is always true when comparing bids of equal tiers across regions.

The ViaSat efficiency design selects Areas A and B, instead of areas C, D and E, to make best use of the budget selected by Dr. Salant for his example. At the 'margin' of this binding budget constraint, the efficiency design optimizes to produce the highest Total Efficiency, which by its form includes coverage

in the computation. The Salant design ignores coverage and mechanically selects bids according to their prioritizations until the budget is exhausted. In this example, under the Salant design, regions with a total reserve price of $69 are selected; under the ViaSat efficiency design, regions with a total reserve price of $70 (and with a higher Total Efficiency) are selected. Again, this is an intentional choice: the efficiency design always selects bids to maximize Total Efficiency, and employs the FCC's stated reserve prices and weights to decide any tradeoffs.

On pages 14-16, a mathematical argument is offered, which claims to 'prove' that Gigabit Low latency service is disadvantaged by the ViaSat efficiency design relative to the Salant design. Dr. Salant's formulation of his argument is incomplete in several ways. First, it excludes the case in which the budget is sufficient to provide Gigabit service to all the areas for which service is offered. In that case, the Salant design may select cheap low-tier bids in some areas over a better Gigabit Low latency bid, which would *always* be selected under the efficiency design. For the case in which the budget is not binding, Dr. Salant's Claim 1 exactly *reverses* the correct conclusion: it is the efficiency design that *always* favors the Gigabit Low Latency service. It is the Salant design that disadvantages such bids.

Second, even when the budget is binding, Dr. Salant's Claim 1 is false. It states that any Gigabit Low latency bid that is selected by the efficiency design is also selected by the Salant design. If there is not sufficient budget to provide the best service in every region, the ViaSat efficiency design – by prioritizing less costly coverage in some areas – sometimes provides Gigabit Low latency service in areas that would receive no service, or lower-tier service, in the Salant design. We illustrate this possibility using a variant of Dr. Salant's own example 3.1, as follows:

1) Raise the budget to $80.
2) Reduce the bids for Area B by the Minimum-High and Gigabit-Low bidders by $5 each.
3) Replace the Baseline-High bidder by an Above Baseline-Low bidder (T=15, L=0), who submits bids of $15 and $60 for Areas A and B respectively.

This gives the following bids, with their 'FCC scores' *S* and `ViaSat' scores *Q* noted:

	Reserve Price	Minimum-High Bid	Above Baseline-Low Bid	Gigabit-Low Bid
Area A	$20	**$5** (S=115, Q=200)	**$15** (S=90, Q=1700)	**$15** (S=75, Q=2000)
Area B	$100	**$20** (S=110, Q=1000)	**$60** (S=75, Q=8500)	**$70** (S=70, Q=10000)

With these areas, bids and budget, the Salant design first selects the Gigabit-Low bid for Area B, and then the Minimum-High bid for Area A. The ViaSat efficiency design, maximizing the Total Efficiency objective subject to the budget constraint, selects the Gigabit-Low bid in Area A and the Above Baseline-Low bid in Area B.

This example refutes Dr. Salant's Claim 1, even in the case of a binding budget. Contrary to his claim, the Gigabit-Low bid in Area A is not selected under the Salant design, but it *is* selected under the efficiency design. (A further advantage of the efficiency design is this example is that, unlike the Salant design, it

does not leave any region with the lowest-tier service.) Dr. Salant's Claim 1 'proof' fails to account correctly for the role of the budget constraint in selecting bids under the ViaSat efficiency design.

Finally, Dr. Salant seems to suggest in his concluding remarks that ViaSat's proposed efficiency design could pose an unduly complex challenge for bidders, particularly smaller bidders. The efficiency design poses no additional complexity as compared to the Salant design, but it does better serve the FCC's goals of balancing higher-tier and lower-cost services. The efficiency design can be implemented exactly by a simple sealed-bid auction, or approximately using a descending clock auction.

Putting the FCC's Objectives into Practice

The FCC has recently adopted scoring and regional preference decisions in pursuit of its goal to provide the best service possible to consumers. The efficiency design proposed by ViaSat accepts these decisions, to interpret and implement the FCC's stated objective, which is to "maximize the value the American people will receive for the universal service dollars we spend." It selects the very best service whenever possible, and only compromises when higher-weighted regions can be served or other areas can receive better service.

The Salant filing obscures the key features of the ViaSat efficiency design. It treats only the special case in which the budget is small relative to the set of areas that receive bids. It presents as typical a few misleading examples that can be changed in minor ways to produce qualitatively different outcomes. And it makes an incorrect analysis of the role that a binding budget plays in bid selection in the ViaSat efficiency proposal. Despite the assertions of the Salant filing, the ViaSat efficiency design fully implements each of the Commission's stated objectives for the CAF II Auction.